

**FERGUS**

**water pollution  
control plant**

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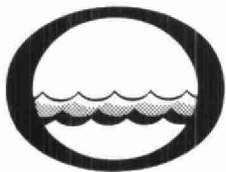
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*Water management in Ontario*

Ontario  
Water Resources  
Commission

135 St. Clair Ave. W.  
Toronto 7  
Ontario


We are pleased to present you with the Operating Summary for the water pollution control facilities operated for you during 1968.

Both the financial and technical information presented should be of assistance to your present and future planning in this important phase of municipal activity.

A new format has been devised to allow greater readability with equally detailed content. We trust that this will meet with your approval.

Our staff wish to express their appreciation for your co-operation throughout the year.

  
D. S. Caverly,  
General Manager.

  
D. A. McTavish, P. Eng.,  
Director,  
Division of Plant Operations.

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**FERGUS**  
**water pollution control plant**

operated for

THE TOWN OF FERGUS

by the

ONTARIO WATER RESOURCES COMMISSION

**1968 ANNUAL OPERATING SUMMARY**

## FOREWORD

● This operating summary outlines the project's technical capabilities and financial status in 1968. Such information mirrors past and present performance, but a major intention is to anticipate the future -- to solve problems before they occur.

The new format in which this year's data are presented is designed to offer a higher level of readability than in the past, without a corresponding decrease in compactness, accuracy and detail.

Although your Regional Operations Engineer carries the major responsibility for the contents of the report, those involved in its preparation are attached to several Commission sections and divisions. The statistics section of the Division of Plant Operations compiled the information for the graphs and charts. The draughting section of the Division of Sanitary Engineering drew the graphs. The Division of Finance provided all cost data.

Only the close co-operation of these departments allowed the publication of this summary.

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## **'68 REVIEW**

During 1968 a total flow of 229.31 million gallons was treated at a cost of \$22,150 or \$96.60 per million gallons, compared with \$79.01 per million gallons in 1967. The total flow in 1968 of 229.31 million gallons was a decrease of 11.1% from 1967. The cost per pound of BOD removed was six cents, the same as in 1967.

The average daily flow of 0.62 mgd was 103% of the design capacity of 0.60 mgd. This design flow was exceeded 52% of the time during the year. BOD and suspended solids reductions of 94% each compared with 92% and 86% respectively in 1967.

The average effluent BOD and suspended solids concentrations of 11 mg/l each were within the OWRC objective of 15 mg/l for each. This objective was exceeded 30% of the time for BOD and a negligible percentage of the time for suspended solids.

The raw sewage BOD loading averaged 178 mg/l but exceeded the design loading of 200 mg/l 60% of the time. Raw sewage suspended solids averaged 193 mg/l and exceeded the design loading of 200 mg/l 50% of the time.

During the year, both the Elora and Fergus WPCPs were operated by the plant staff stationed at Fergus. Under the supervision of head office engineers, the staff operated a clean, attractive and efficient plant for the Town of Fergus.



## PROJECT COSTS

NET CAPITAL COST (Final)	
Long Term Debt to OWRC	<u>\$277,393.48</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1968	<u>\$102,083.19</u>
Net Operating	\$ 22,150.62
Debt Retirement	10,064.00
Reserve	1,697.42
Interest Charged	<u>15,573.81</u>
TOTAL	<u>\$ 49,485.85</u>

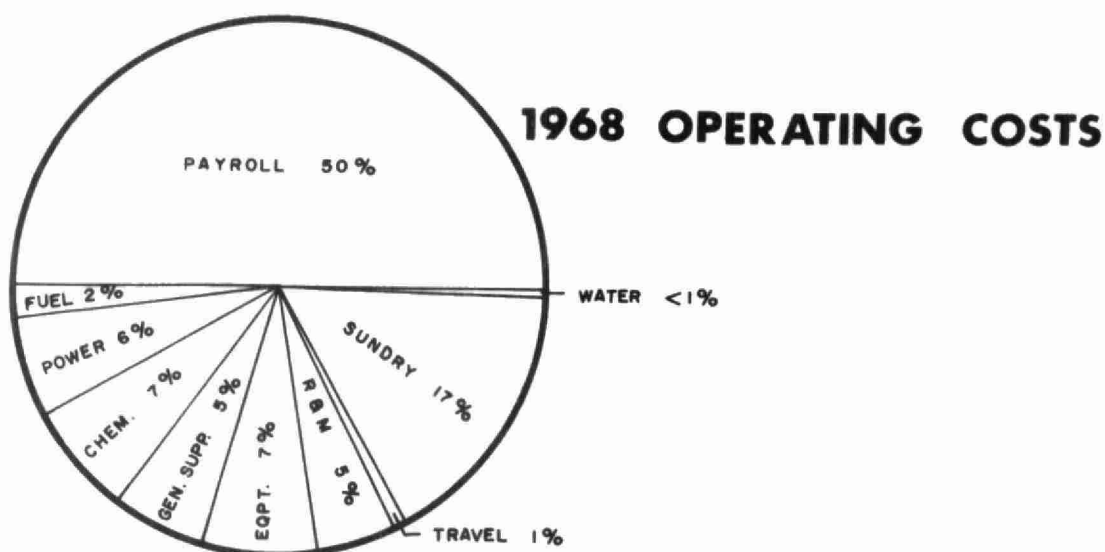
### RESERVE ACCOUNT

Balance at January 1, 1968	\$ 10,400.59
Deposited by Municipality	1,697.42
Interest Earned	519.55
	<u>          </u>
	\$ 12,617.56
Less Expenditures	<u>2,964.42</u>
Balance at December 31, 1968	<u>\$ 9,653.14</u>

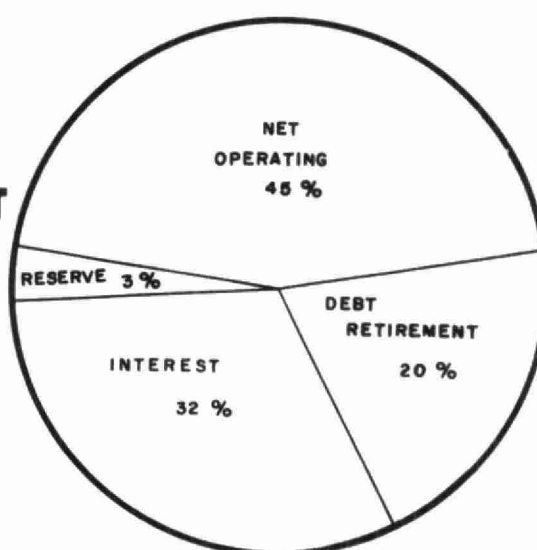
## Monthly Operating Costs

MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAY ROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	* SUNDRY	WATER	TRAVEL
JAN	932.64	785.71	-	-	124.83	-	14.00	-	-	-	8.10	-
FEB	1635.43	703.75	-	99.86	126.04	-	34.92	50.39	283.75	311.96	-	4.76
MAR	2215.55	1220.24	-	93.86	124.83	238.61	112.94	-	57.44	355.59	-	12.04
APRIL	2019.81	929.26	-	101.72	120.38	238.61	102.63	272.36	35.15	201.44	9.94	5.32
MAY	1135.23	616.55	-	-	113.85	-	85.74	-	8.00	303.61	-	4.48
JUNE	1727.00	687.29	152.13	-	109.40	238.61	86.35	-	136.45	302.77	-	14.00
JULY	1652.07	481.97	288.93	-	113.85	-	205.89	74.90	77.80	333.37	8.10	22.26
AUG	1998.59	1009.15	440.70	-	-	119.31	123.80	-	287.15	-	-	18.48
SEPT	1727.87	484.36	-	-	337.10	119.31	79.12	37.40	62.19	58.08	-	10.22
OCT	1516.35	729.16	-	-	4.46	-	126.99	337.05	1.50	28.88	8.10	10.22
NOV	1779.87	651.21	-	-	120.38	292.96	141.09	-	24.20	42.53	-	77.50
DEC	3810.21	1705.88	173.68	107.88	126.04	238.61	115.50	754.30	54.82	52.85	-	10.65
TOTAL	22150.62	10004.53	1055.44	403.32	1421.16	1486.02	1228.97	1526.49	1028.45	372.08	34.24	189.92

\*SUNDRY INCLUDES SLUDGE HAULING COSTS WHICH WERE \$3,370.52



### TOTAL ANNUAL COST



### Yearly Operating Costs

YEAR	M.G.TREATED	TOTAL COST	COST PER MILLION GALLONS	COST PER LB OF BOD REMOVED
1964	180.12	\$19,881.89	\$110.37	4 cents
1965	208.34	21,760.15	104.45	3 cents
1966	219.05	20,582.17	93.96	4 cents
1967	258.03	20,388.07	79.01	6 cents
1968	229.31	22,150.62	96.60	6 cents

## **Process Data**

The average daily flow of 0.62 mgd was 103% of the design capacity of 0.60 mgd. During 1967 the average flow was 0.707 mgd or 118% of the design flow.

This decrease in flow can be attributed to a program being carried out by the Town of Fergus to provide separated sewers.

Both the BOD and suspended solids concentrations averaged less than the design values. The percent reductions of 94% for each of these is in the normal range for activated sludge plants.

The average BOD and suspended solids concentrations of 11 mg/l were within the OWRC objective of 15 mg/l for each.

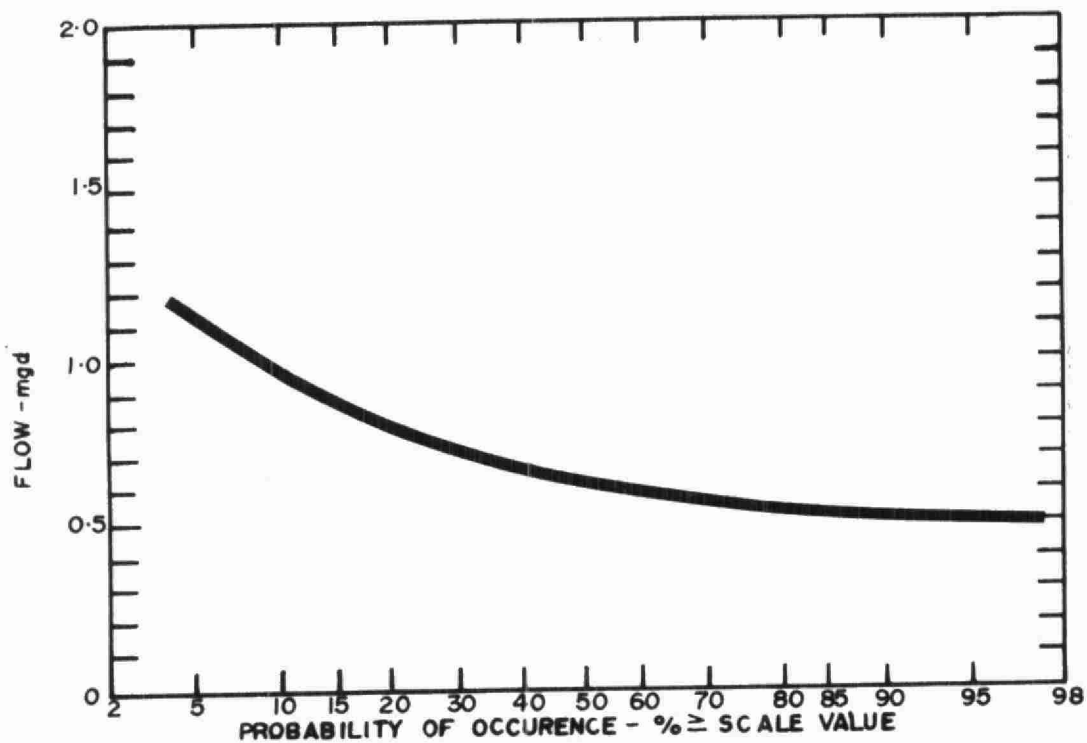
## PLANT FLOWS and CHLORINATION

MONTH	TOTAL FLOW mg	AVERAGE DAILY FLOW mg	MAXIMUM DAILY FLOW mg	MINIMUM DAILY FLOW mg	CHLORINE USED lbs.	DOSAGE mg/l
JAN	15.77	.509	.691	.400	831	5.3
FEB	19.39	.669	1.334	.426	648	3.3
MAR	25.18	.814	1.195	.432	798	3.2
APR	20.07	.669	1.105	.472	847	4.2
MAY	15.72	.507	.630	.417	748	4.8
JUN	14.62	.487	.808	.403	646	4.4
JUL	18.18	.586	1.050	.414	639	3.5
AUG	21.66	.699	1.113	.408	685	3.2
SEPT	20.58	.686	1.123	.437	720	3.5
OCT	17.03	.549	.703	.460	838	4.9
NOV	18.95	.632	1.236	.414	713	3.8
DEC	22.16	.715	1.115	.722	760	3.4
TOTAL	229.31	-	-	-	8873	-
AVERAGE	-	.620	-	-	739	3.9

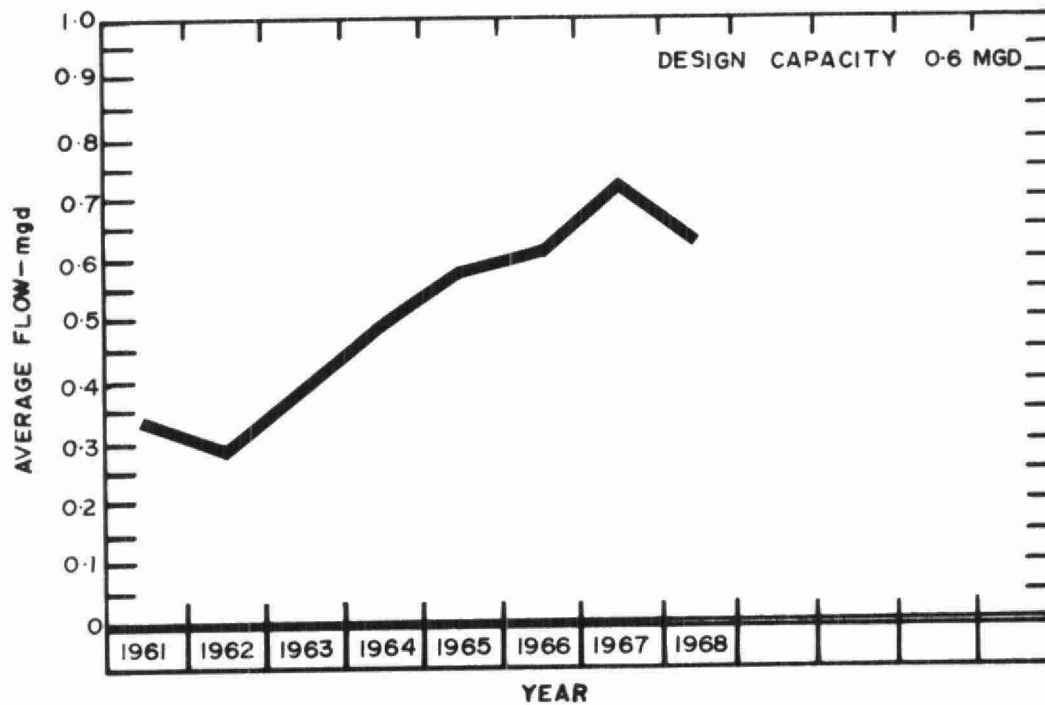
### COMMENTS

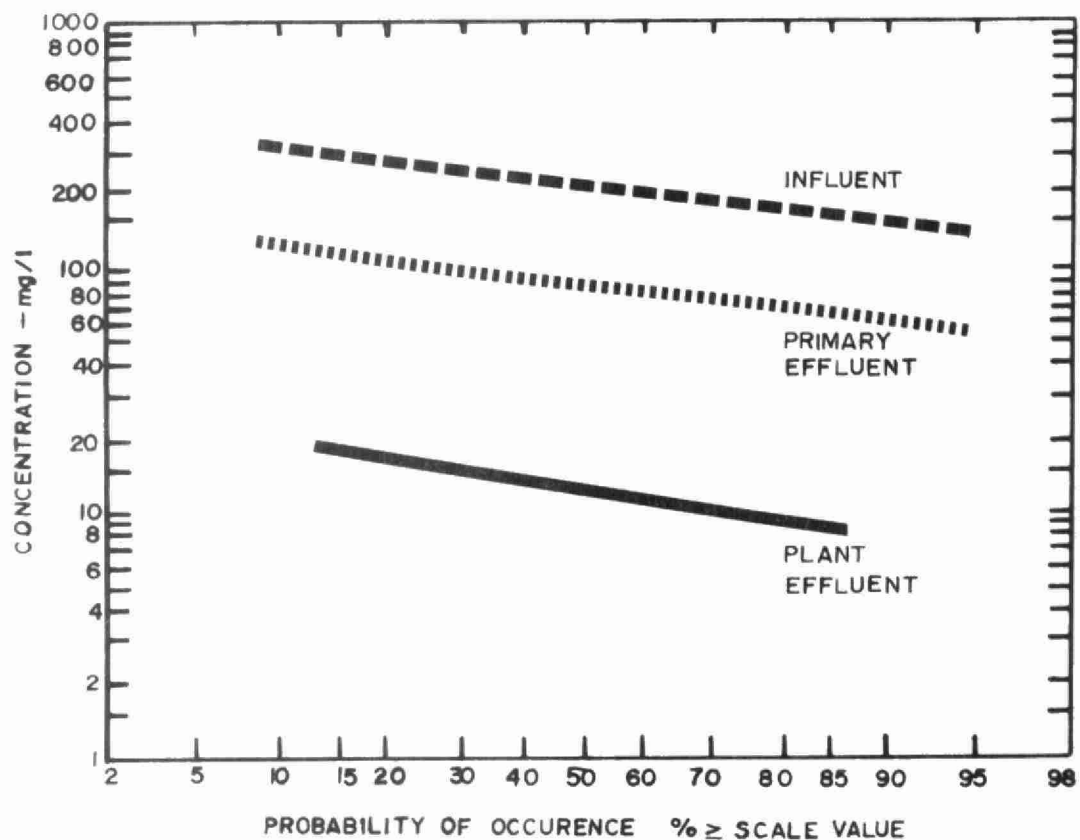
The maximum daily flow of 1.334 mgd occurred in February. This was more than twice the design capacity. The average daily flow was 0.62 mgd, 103% of the design flow.

The average chlorine dosage rate of 3.9 mg/l was sufficient to maintain a chlorine residual of 0.5 mg/l.

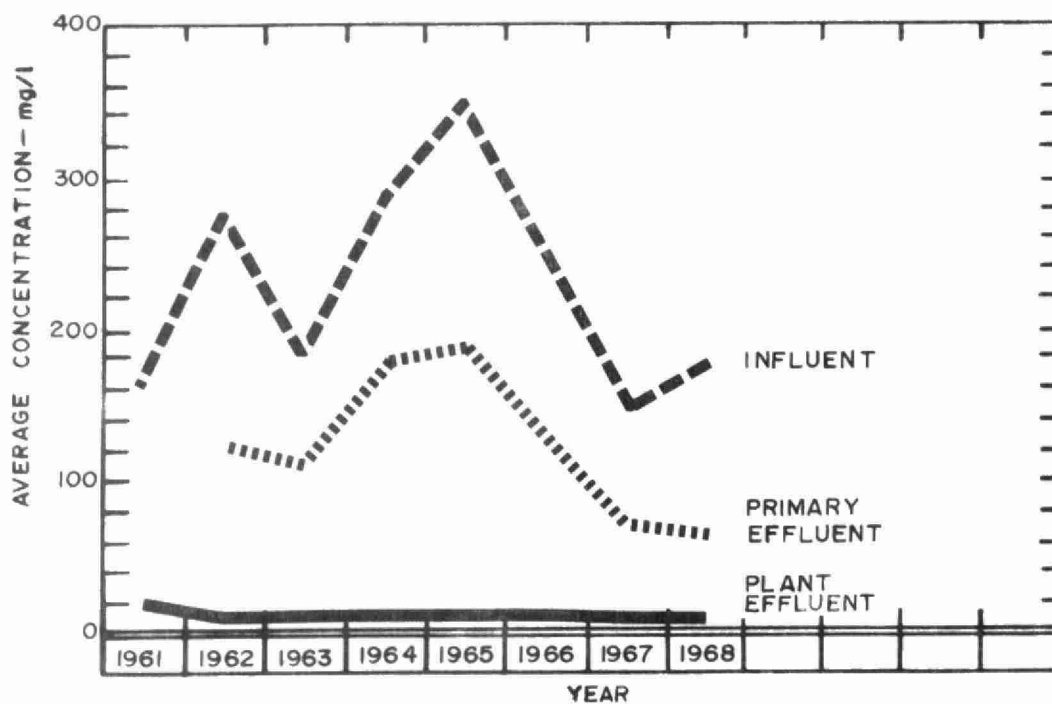


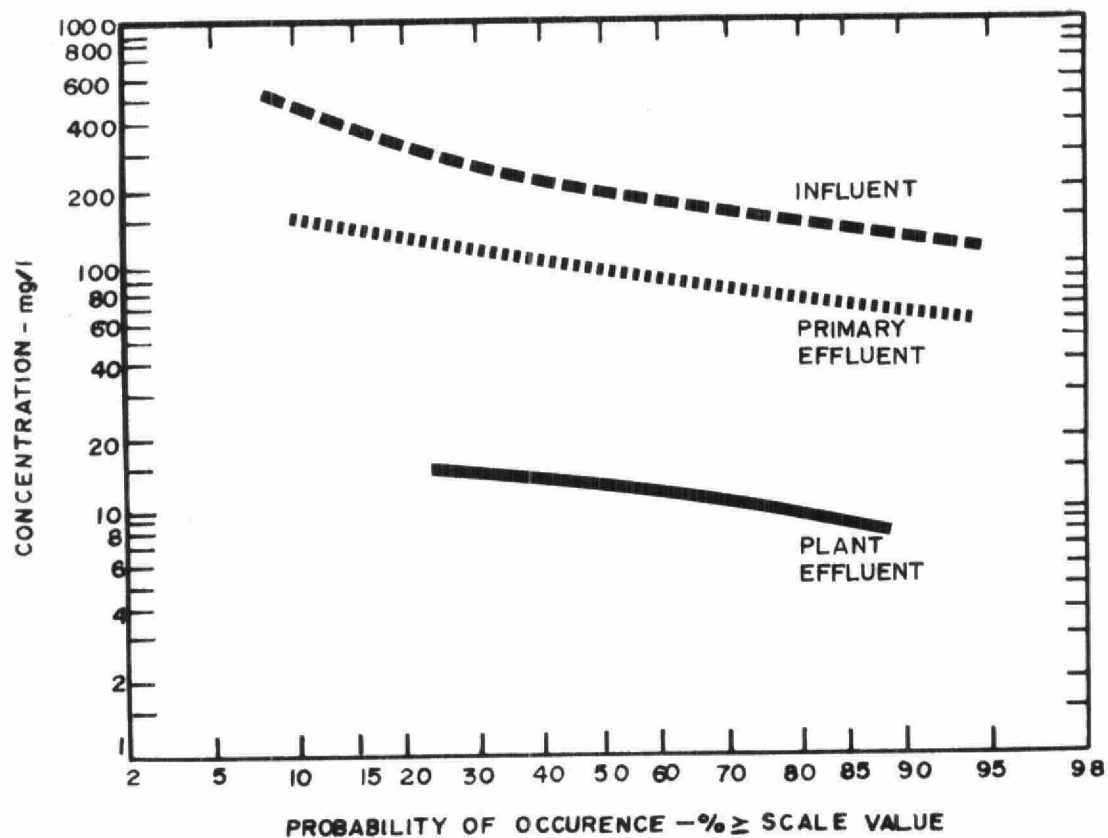
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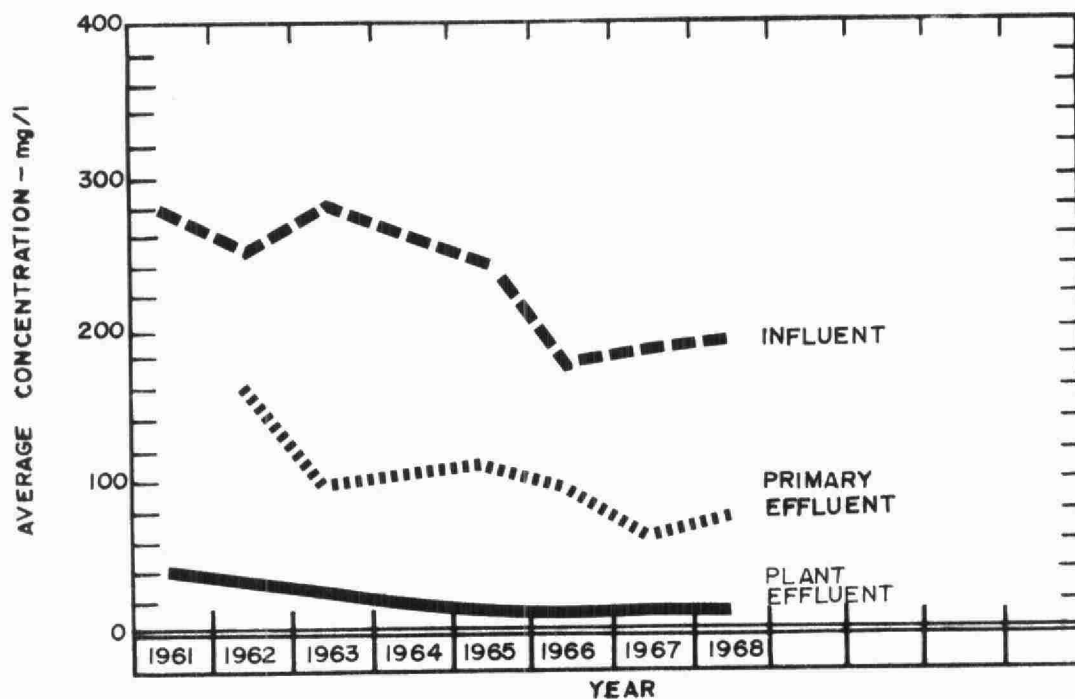


## BIOCHEMICAL OXYGEN DEMAND





## SUSPENDED SOLIDS





## PLANT EFFICIENCY

MONTH	BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				GRIT
	INF CONC <sup>N</sup> mg/l	EFF CONC <sup>N</sup> mg/l	RED <sup>N</sup> %	REMOVAL 10 <sup>3</sup> lb	INF CONC <sup>N</sup> mg/l	EFF CONC <sup>N</sup> mg/l	RED <sup>N</sup> %	REMOVAL 10 <sup>3</sup> lb	REMOVAL ft <sup>3</sup>
JAN	-	16	-	-	-	12	-	-	55
FEB	165	12	83	29.7	186	11	94	33.9	33
MAR	250	12	95	59.9	155	11	93	36.3	20
APR	285	7	97	42.7	392	14	96	75.9	13
MAY	92	14	85	12.3	189	13	93	27.7	14
JUN	-	-	-	-	-	-	-	-	15
JULY	120	8	93	20.3	137	7	95	23.6	32
AUG	195	8	96	40.6	111	7	94	22.4	42
SEPT	140	7	95	27.4	179	12	93	34.4	26
OCT	-	-	-	-	-	-	-	-	20
NOV	-	-	-	-	-	-	-	-	8
DEC	-	-	-	-	-	-	-	-	12
TOTAL	-	-	-	-	-	-	-	-	290
AVERAGE	178	11	94	33.3	193	11	94	36.3	24

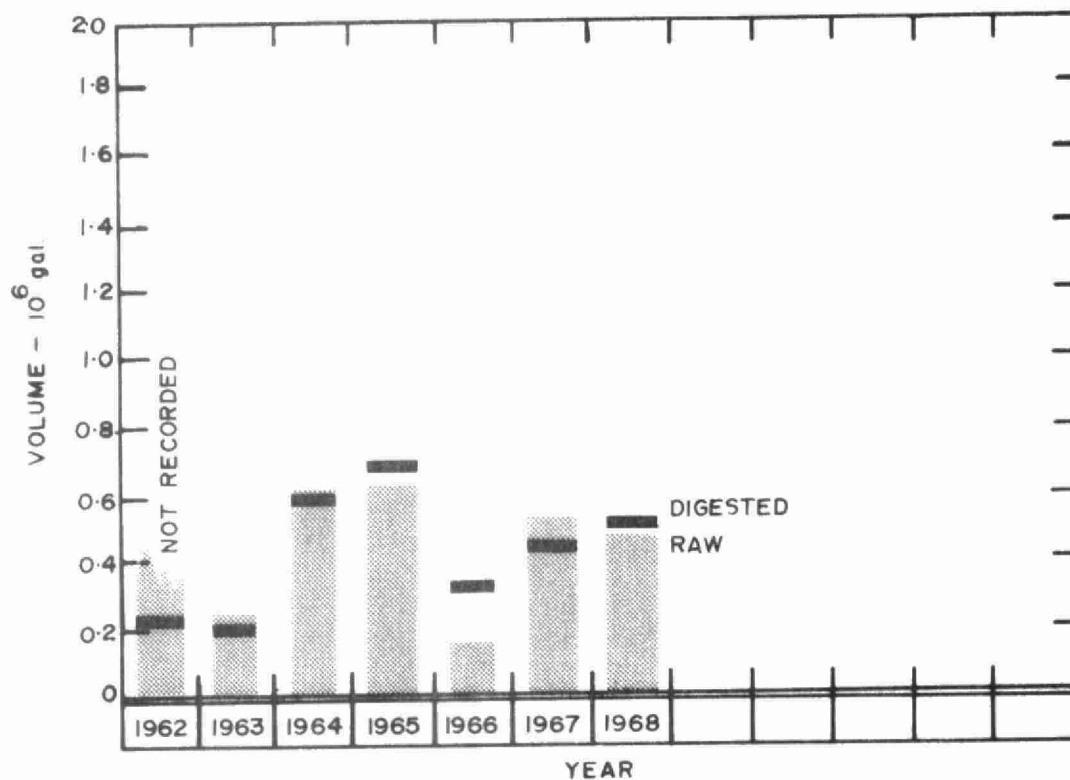
### COMMENTS

The BOD and suspended solids reductions of 94% for each compared with 92% and 86% respectively in 1967. Despite the decrease in flows, the amount of grit removed was virtually the same in 1968 as in 1967.

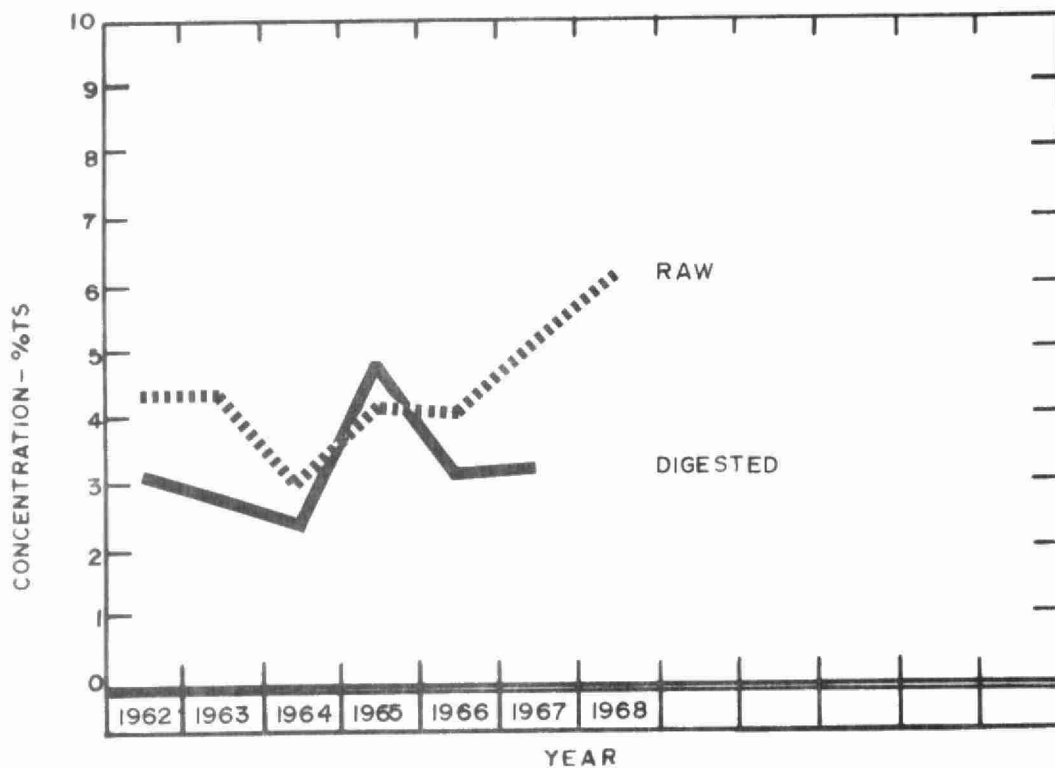
The OWRC objectives of not more than 15mg/l of BOD and suspended solids in the effluent was achieved 70% of the time for BOD and 99% of the time for suspended solids. This is excellent treatment.

# AERATION

MONTH	AVERAGE FLOW mgd	PRIMARY EFF		SECONDARY EFF		MLSS CONC <sup>N</sup> mg/l	F/M $\left(\frac{\text{lb BOD}}{\text{lb MLSS}}\right)$	AIR USED $\left(\frac{1000 \text{ ft}^3}{\text{lb BOD}}\right)$ REMOVED	WASTE SLUDGE 10 <sup>3</sup> lb
		BOD CONC <sup>N</sup> mg/l	SS CONC <sup>N</sup> mg/l	BOD CONC <sup>N</sup> mg/l	SS CONC <sup>N</sup> mg/l				
JAN	.509	60	92	16	12	2,280	.10	-	1.74
FEB	.669	88	98	12	11	3,230	.13	-	5.32
MAR	.814	120	117	12	11	3,310	.21	-	5.55
APRIL	.669	14	34	7	14	3,040	.02	-	6.79
MAY	.507	60	85	14	13	2,530	.09	-	5.51
JUN	.487	-	-	-	-	2,120	-	-	5.17
JUL	.586	60	55	8	7	2,840	.09	-	9.37
AUG	.699	64	57	8	7	3,180	.10	-	5.83
SEPT	.686	56	95	7	12	2,820	.10	-	6.92
OCT	.549	-	-	-	-	2,380	-	-	4.90
NOV	.632	-	-	-	-	2,692	-	-	4.41
DEC	.715	-	-	-	-	3,280	-	-	6.39
TOTAL	-	-	-	-	-	-	-	-	67.90
AVERAGE	.620	65	79	11	11	2,810	.09	-	5.66



## DIGESTION



## SLUDGE DIGESTION and DISPOSAL

MONTH	RAW SLUDGE			DIGESTED SLUDGE			SUPERNATANT		SLUDGE DISPOSAL	
	VOLUME 10 <sup>3</sup> gal	T. S. %	V. S. %	VOLUME 10 <sup>3</sup> gal	T. S. %	V. S. %	VOLUME gal	T. S. %	LIQUID yd <sup>3</sup>	DEWATERED yd <sup>3</sup>
JAN	39.2	-	-	56.9	-	-	-	-	338	0
FEB	33.5	4.2	70	49.3	-	-	-	-	292	0
MAR	40.6	4.9	69	30.3	-	-	-	-	180	0
APR	43.6	4.6	70	46.8	-	-	-	-	278	0
MAY	42.6	-	-	45.5	-	-	-	-	270	0
JUN	40.1	6.7	61	49.3	-	-	-	-	292	0
JUL	41.0	-	-	45.5	-	-	-	-	270	0
AUG	41.8	9.3	71	45.5	-	-	-	-	270	0
SEPT	46.2	7.3	63	45.5	-	-	-	-	270	0
OCT	48.0	5.6	59	45.5	-	-	-	-	270	0
NOV	47.7	7.0	63	55.6	-	-	-	-	330	0
DEC	29.0	5.9	60	25.3	-	-	-	-	150	0
TOTAL	493.3	-	-	541.0	-	-	-	-	3210	0
AVERAGE	41.1	6.2	65	45.0	-	-	-	-	268	0

### COMMENTS

A total of 3210 cu. yd. of digested sludge was hauled from the plant. The raw sludge concentration of 6.2% total solids is a normal figure.

The discrepancy between total volume of raw sludge to the digester and digested sludge removed from the digester indicates an error in the measurement of one or both of these quantities.

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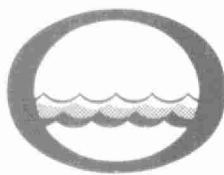


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## **CONCLUSIONS**

The plant operated efficiently during the year, producing an effluent well within the OWRC objectives.

In the fall of 1966, expansion of the existing plant was initiated due to hydraulic overloading. at the end of 1968, a decision had not yet been reached on whether a primary clarifier should be included in the plant extension or the town's separated sewer program should be advanced.



*Water management in Ontario*